MOUND

Environmental
Restoration
Program

OhioEPA

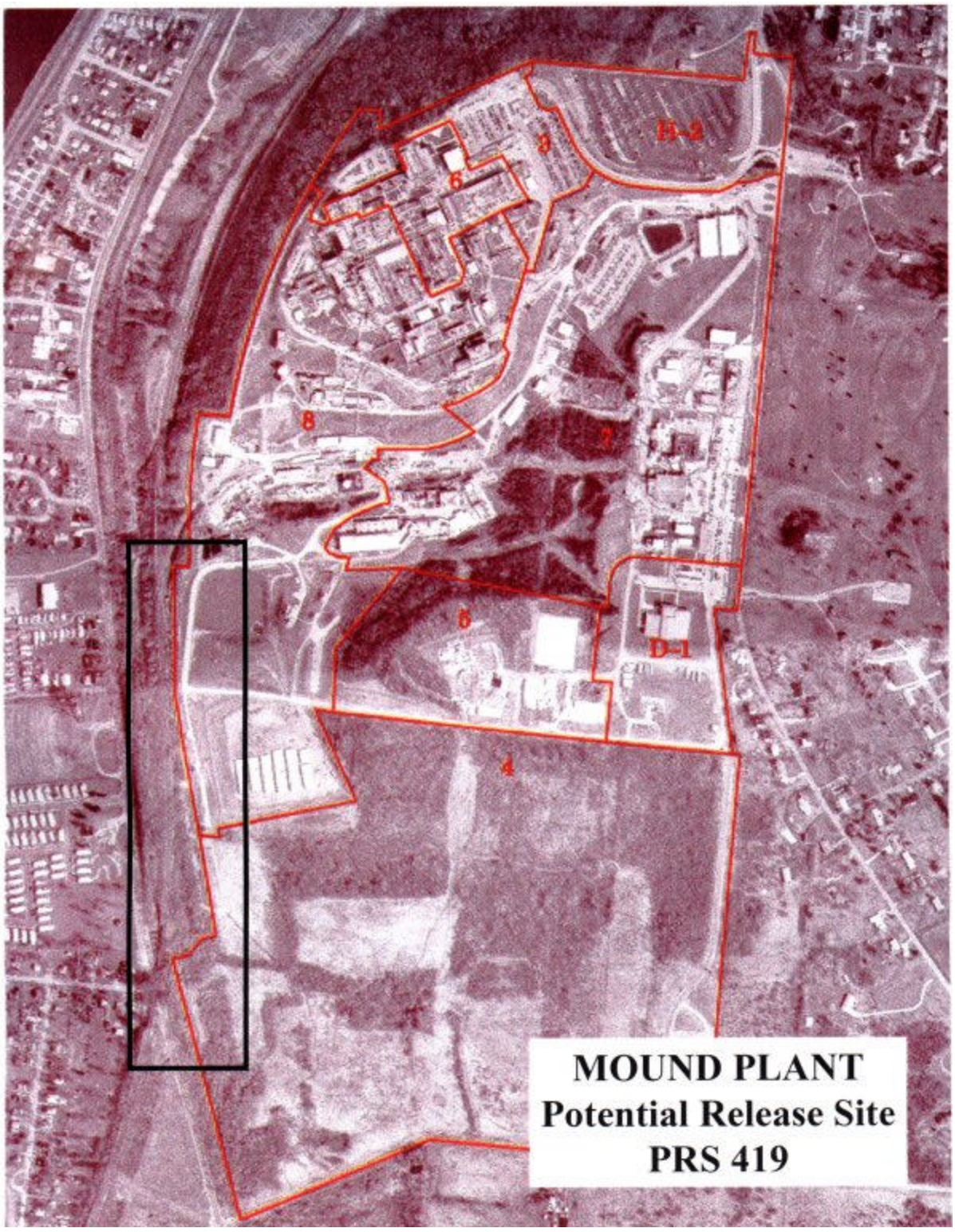
MOUND PLANT

Potential Release Site Package

PRS #419

PRS 419

REV	DESCRIPTION	DATE
WORKING DRAFT		**Sept. 13, 1999**
DRAFT		**Sept. 20, 1999**
DRAFT PROPOSED FINAL	Incorporated changes to narrative addressed at binning on 10/20/99. Responses to OEPA written comments incorporated in narrative as required.	**Nov. 29, 1999**
PUBLIC REVIEW DRAFT		**Jan. 19, 2000**
FINAL		


H-4
3
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D-1
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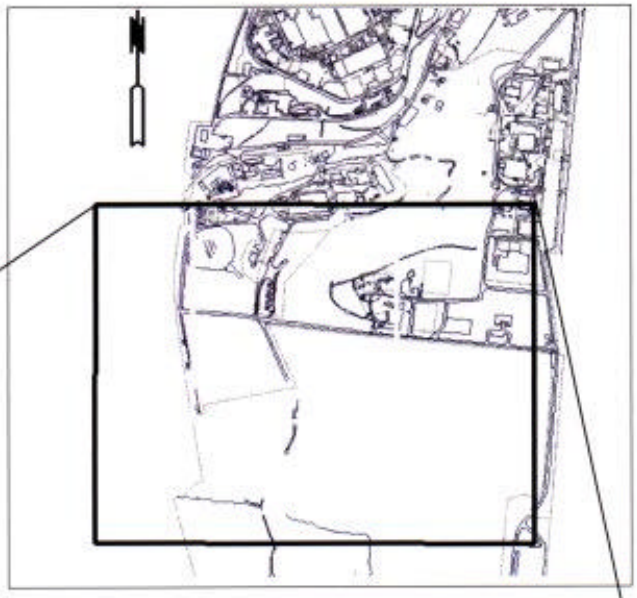
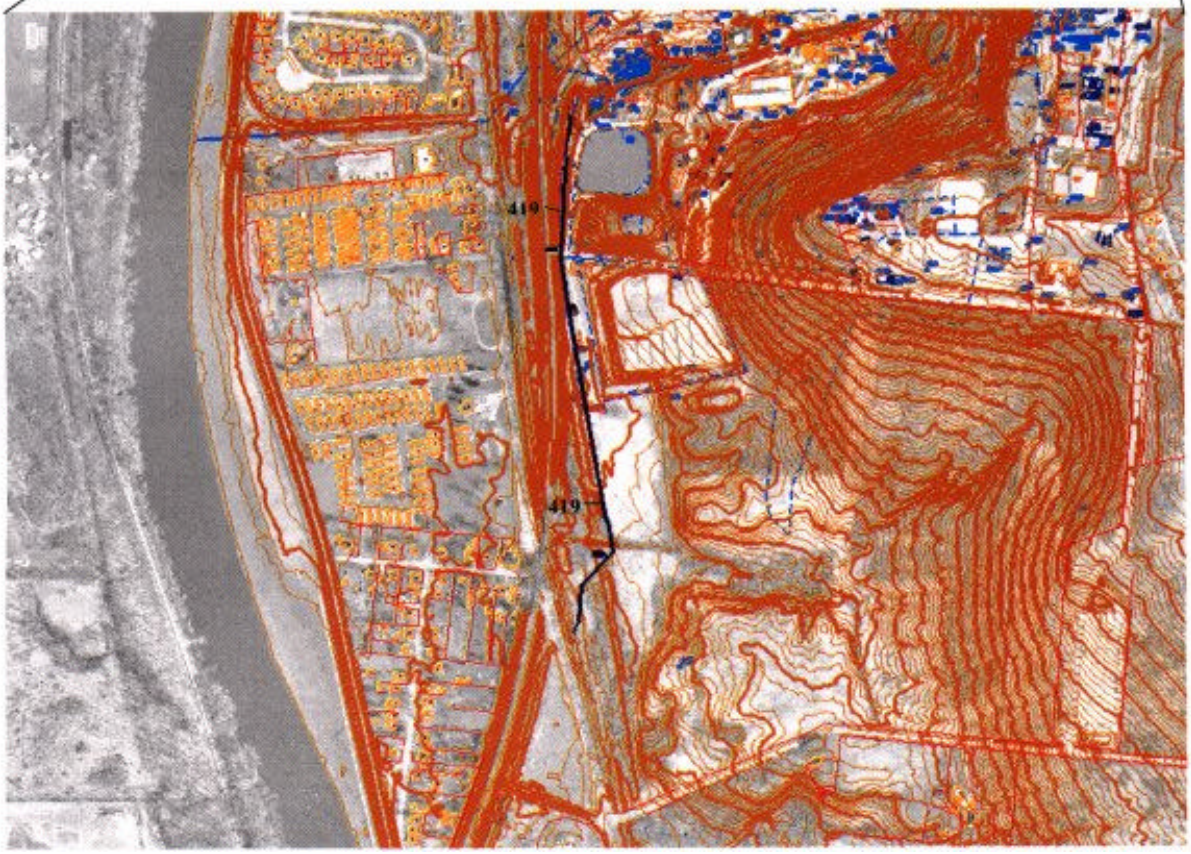
MOUND PLANT
Potential Release Site
PRS 419

Mound Plant
PRS 419
Drainage Outflow Reroute

On the map below:
- PRS number and location shown in black
- Fencing shown in red
- Elevation contours shown in brown
- Other PRS's shown in blue





PRS 419

PRS HISTORY:

Potential Release Site (PRS) 419 identifies the Mound Plant Drainage Outflow Reroute constructed as part of the Miami-Erie Canal Remediation Project. It is depicted in Figure 1, and serves to convey the Plant site's non-process and storm water off-site. The reroute was constructed to accomplish this function upon the closing of the historical stormwater outflow known as the "Twin 60s," depicted as PRS 416 in Figure 1. Also see Figure 2.

The Mound Plant Drainage Outflow Reroute was accomplished during the period of June to November 1996[1]. The reroute extends for a length of approximately 4500 feet proceeding south from its entrance near the concrete sealed "Twin 60s" before exiting the Mound Plant property and emptying into the Great Miami River. Note Figure 3.

BACKGROUND

PRS 419 is fed by the Mound Plant drainage, retention, and outflow (PRS) group as noted in Figures 1 and 4. This group drains a majority of the original plant site's 155 acres. Included in the group are PRS 69, Overflow Pond, and PRS 418, Overflow Pond South Inlet (SM/PP Hill Drainage Flume), both yet to be evaluated; and three PRSs determined to require Further Assessment-

PRS 67 - Plant Drainage Ditch[2]
PRS 68 - Asphalt-Lined Pond[3]
PRS 70 - Retention Basins, including Weir Basin[4]

CONTAMINATION

Since its construction, the Mound Plant Drainage Outflow Reroute has been monitored for contamination at Outfall 002 under two programs. Monitoring for radiological parameters is required under DOE Order 5400.1 and the DOE Regulatory Guide. Effluent from outflow is regulated by the Plant site's NPDES permit for non-radiological parameters. Since construction of the Drainage Outflow Reroute in 1996 and for the years 1997[5] and 1998[6], no radiological or non-radiological parameters, except suspended solids, have been exceeded. See References 5 and 6. Suspended solid exceedances are typically the result of prolonged or intense rainfall.

READING ROOM REFERENCES:

1) On Scene Coordinator (OSC) Report, OU-4 Miami-Erie Canal, Removal Action, Final, June 1999
5) Annual Site Environmental Report for Calendar Year 1997, September 1998

OTHER REFERENCES

2) Mound Plant Potential Release Site Package, PRS 67, Plant Drainage Ditch, FA/Hold, 5/15/96
3) Mound Plant Potential Release Site Package, PRS 68, FA/Hold, 3/20/96
4) Mound Plant Potential Release site Package, PRS 70, Retention Basins, including Weir Basin, FA/Hold, 7/17/96
6) Annual Site Environmental Report For Calendar Year 1998, September 1999 (pending)

PREPARED BY:

Joseph Geneczko, Member of Babcock &Wilcox of Ohio Technical Staff

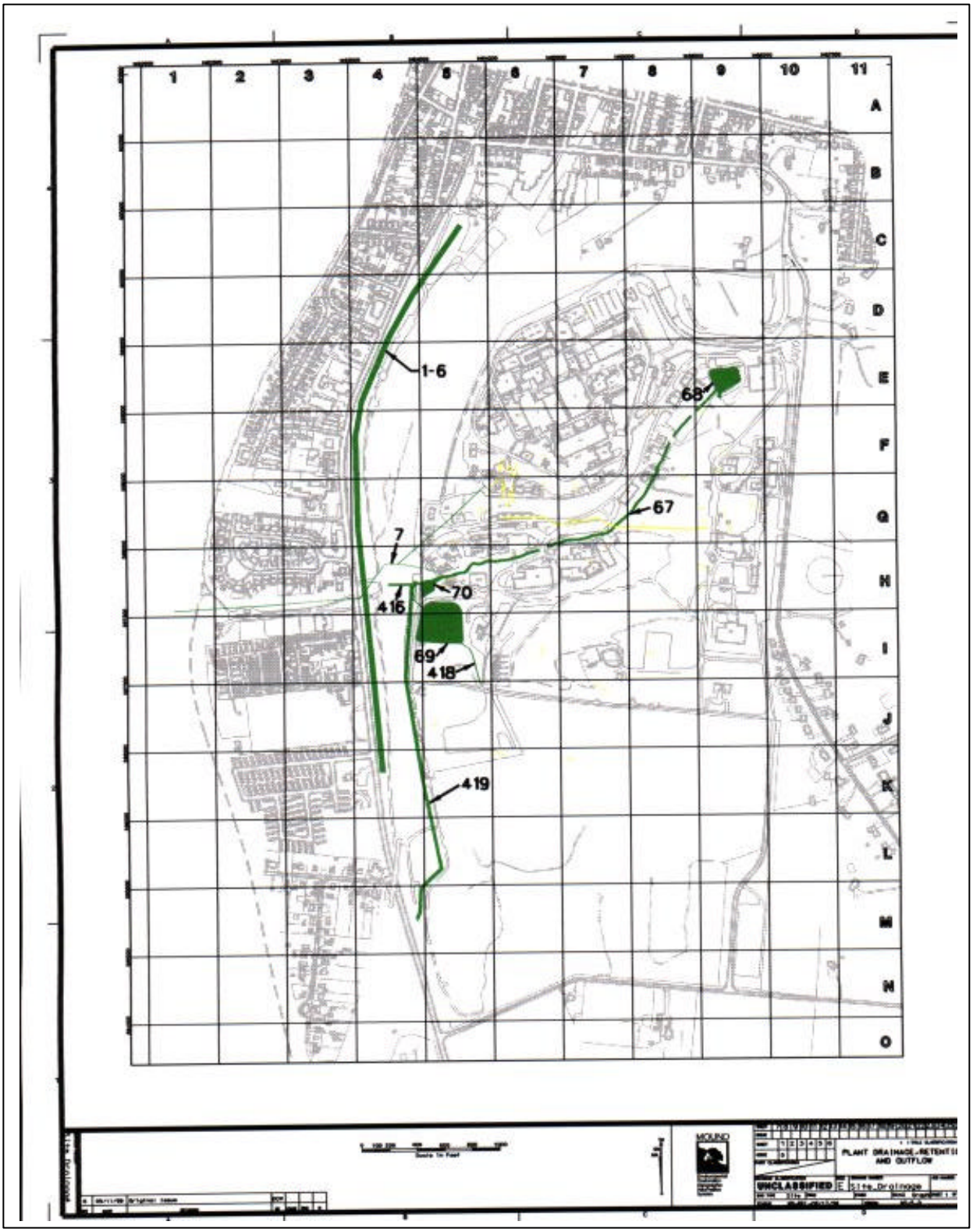


Figure 1. Mound Plant Drainage, Retention, and Outflow Group (Graphic)

Figure 2. Entrance To Drainage Outflow Reroute

Figure 3a. PRS 419 Graphic

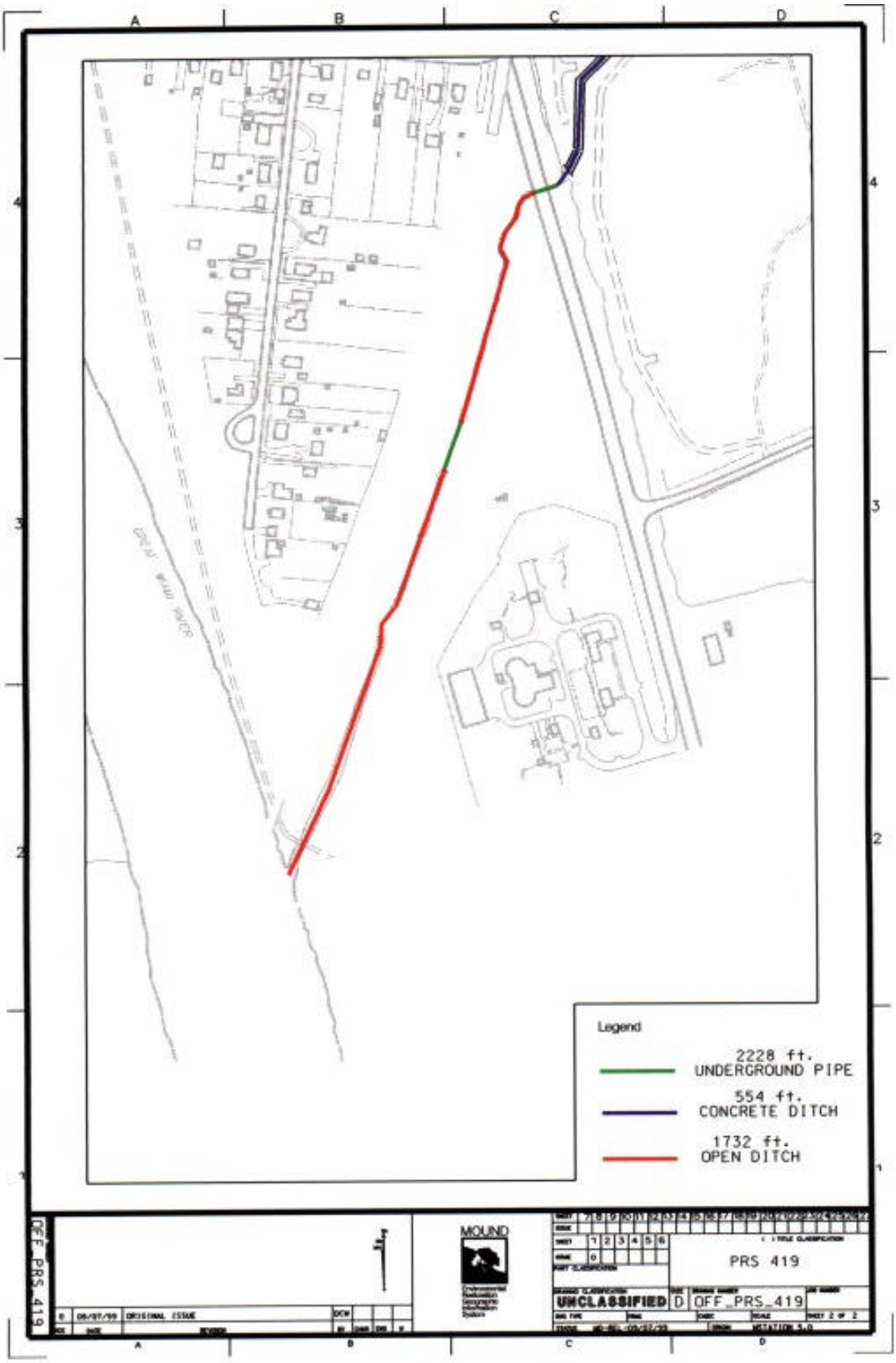


Figure 3b. PRS 419 Graphic

Figure 4. Mound Plant Drainage, Retention, and Outflow Group (Pictorial)

MOUND PLANT
PRS 419
DRAINAGE OUTFLOW REROUTE

RECOMMENDATION:

Potential Release Site (PRS) 419 is the Mound Plant Drainage Outflow Reroute. It was constructed as part of the Miami-Erie Canal Remediation Project during the period from June to November 1996[1]. The reroute extends for a length of approximately 4500 feet proceeding south from its entrance near the concrete sealed "Twin 60s" before exiting the Mound Plant property and emptying into the Great Miami River. It conveys the Plant site's non-process and storm water off-site. Since its construction, the Mound Plant Drainage Outflow Reroute has been monitored for contamination at Outfall 002 under two programs. Monitoring for radiological parameters is required under DOE Order 5400.1 and the DOE Regulatory Guide. Monitoring for non-radiological parameters is required by the Plant site's NPDES permit. Monitoring of the Outfall 003 will continue as required by the Authorization to Discharge. Monitoring of Outfall 002 will continue as required by the NPDES permit for non radiological parameters. To address potential radiological releases, including those undergoing investigation and clean up under CERCLA, Outfall 002 will be also monitored daily for gross alpha and tritium, bi-weekly from flow-proportional 24 hour composite samples for Pu-238, Pu-239/240, U-233/234, U-238, Th-228, Th-230, and Th-232.

Therefore NO FURTHER ASSESSMENT is recommended for PRS 419.

CONCURRENCE:

DOE/MEMP: Arthur W. Kleinrath, Remedial Project Manager (date) 11/17/99

USEPA: Timothy J. Fischer, Remedial Project Manager (date) 11/17/99

OEPA: Brian K. Nickel, Project Manager (date) 11/17/99

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

Reference Material

PRS 419

Reference 1

ON SCENE COORDINATOR (OSC) REPORT

OU-4 Miami-Erie Canal

REMOVAL ACTION

MOUND PLANT
MIAMISBURG, OHIO

June 1999

Final

(Revision 0)

Department of Energy

Babcock & Wilcox of Ohio

opening for the canal site clearing and grubbing work was held. Five bids were received and Cumbo Excavating of Columbus, Ohio was the successful low bidder. Conrail access was approved. Modifications to the Rail Spur Upgrade were completed.

May 1996 — Cumbo Excavating started construction fieldwork for site clearing and grubbing. The mobile lab, instrumentation, and the site trailer were delivered to Mound.

June 1996 — The site drainage reroute contract was awarded to Glover Excavating. The articulating haulers were delivered.

July 1996 — Glover Excavating began construction fieldwork for the site drainage reroute. Terran Corporation was awarded the contract for monitoring well abandonment.

August 1996 — Advanced Sewer Technologies performed videotaping of the sanitary sewer in the North Canal. The construction fieldwork for the site clearing and grubbing work and the access roads were completed. The vegetation slash, that had been sampled, analyzed and found contaminant free, was chipped and spread.

September 1996 — During excavation of the underground site drainage reroute piping, a concrete slab with stained and oil-smelling soil was discovered. Excavation was stopped and field sampling/analysis indicated contamination from Stoddard Solvent. Approximately 200 yards of soil was removed and staged at the bioremediation facility for treatment. Fieldwork for the monitoring well abandonment was completed. Preparation of the well dossiers and field reports were completed and submitted to DOE and the regulators.

October 1996 — Completed fieldwork for site perimeter fencing in the South canal. Completed construction of the on-site soil staging area (at the rail spur). Verification sampling at the South Pond, Runoff Hollow, Overflow Creek and miscellaneous stakeholder areas (off-site areas) was initiated. Access Road extensions were completed.

November 1996 — Site Drainage Reroute pipe installation and headwall fabrication were completed. The site perimeter fencing (both North and South Canals) was completed. Completed final preparations of the Soil Staging Area (installation of asphalt, jersey barriers, and perimeter fencing). Verification Sampling was completed in the stakeholder areas. Excavation of the OU4 Miami-Erie Canal soils began on November 11, 1996, at the area south of the weir and the soils were

Reference 2

PRS 67

PRS HISTORY:

Potential Release Site (PRS) 67 [1] was originally identified by the Preliminary Review/Visual Site Inspection conducted by the U.S. Environmental Protection Agency in 1988.[2] It is an open, unlined channel that flows above ground through the central part of the facility from Building 22 to the retention basins on the western plant boundary. The ditch carries surface run-off from both the Main Hill and the SM/PP Hill areas, as well as the asphalt lined pond that drains to the ditch through a culvert, emerging behind Building 22. From that point, the open ditch falls 40 feet over a length of 1800 feet. The banks rise steeply from 8 to 20 feet above the flow line of the ditch, and its width varies from 30 to 80 feet.[3, 4] The upper-most reach of the ditch was infilled and reclaimed for development in the late 1960s. In the 1960s and early 1970s, the plant drainage ditch received systematic releases of low-activity plutonium-238 wastewaters from operations in the SM and WDA Buildings.[5] Periodic spills due to Mound Plant operations have occurred since the 1950's and are documented in investigation reports.[6] The contaminants involved included fuels, solvents, oils, cooling-water brines (calcium chloride and zinc chromate), ethylene glycol, and plutonium-238 wastewaters which reached the ditch via surface runoff.[6]

CONTAMINATION:

Several independent surface and subsurface investigations have been conducted at or near the plant drainage ditch (PRS 67). The first was a result of discovery of plutonium-238 in the Miami-Erie canal in 1974. Fifty-five samples up to six feet deep over the full length of the ditch were collected and analyzed by wet chemistry methods at Mound. The results of that investigation indicated that plutonium-238 was present at concentrations over 25 pCi/g in 25% of the samples, at concentrations up to 535 pCi/g.[4] The guideline criteria (ALARA) for Pu-238 is 25 pCi/gm.

In 1986, portions of the ditch were remediated as part of the Mound decontamination and decommissioning (D&D) Program removal of the WTS pipeline. During verification sampling, 1027 pCi/g of plutonium-238 were found 3-4 feet underground where the pipeline had crossed the ditch.[4] Subsequently, excavation and removal along the pipeline trench reduced that source to <100 pCi/g.[7]

As part of the Environmental restoration (ER) Program Operable Unit 6, verification sampling was conducted along the length of the former WTS pipeline[7]. Three soil samples were collected from a soil boring where the pipeline had crossed the plant drainage ditch . All samples were analyzed for volatile and semi-volatile organic compounds, pesticides and PCBs, total metals and radiological parameters. The results are summarized in Table 1.

Table 1 - Summary of Subsurface Verification Sample (Location 19-4A at Plant Drainage Ditch) Results [7] above Guideline Criteria

Parameter	No. of Samples	Risk-Based Guideline Criteria	Concentration Range	Units
Plutonium-238	1	25	68.84	pCi/g
Thorium-228	2	0.85	0.86-1.23	pCi/g
Beryllium	2	0.7	0.82-8.5J	mg/kg
Aroclor 1248	3	0.38	36-38UJ	mg/kg
Aroclor 1254	3	21.5	36-38UJ	mg/kg
Aroclor 1260	3	0.41	36-38UJ	mg/kg
Dieldrin	3	0.185	1.4-1.9UJ	mg/kg

U = non-detected, J = estimated

In 1995, the Other Soils Investigation was conducted as part of the Mound D&D Program characterization sampling of known or suspected areas of radiological contamination.[8] Fifty-one locations up to 6 feet in depth were sampled along the exposed extent of the plant drainage ditch.[8] Samples were subjected to field screening for volatile organic compounds using an organic vapor analyzer (OVA) and field instrument for detection of low-energy radiation (FIDLER) survey for plutonium-238 and thorium-232. Samples were additionally analyzed for 1) plutonium-238 and thorium-232 by the Mound Soil Screening Facility, and 2) metals using a portable x-ray fluoroscope (PXRF). Although the project collected samples for corroborative laboratory analysis, none were collected from the ditch locations. Of 170 individual samples, 23 exhibited concentrations of plutonium-238 that exceeded the Mound as low as reasonable achievable (ALARA) guideline of 25 pCi/g. The maximum concentration was 241 pCi/g in the lower reach of the ditch , just north of Building 34. The PXRF results were inconclusive, but suggested that no hazardous metals are present. Field screening for volatile organic compounds qualitatively indicated that 8 locations exhibited measurements above background.[8]

As part of the Environmental restoration (ER) Program Operable Unit 9, Remedial Investigation surface waters and sediments were sampled at 8 locations along the plant drainage ditch in Fall 1994 and Spring 1995.[9] In addition, subsurface samples were collected in the Fall 1994 at 3 boreholes that ranged in depth up to 36.5-feet below ground surface. Samples were analyzed for volatile and semi-volatile organic compounds, pesticides and PCBs, total metals and radiological parameters. As part of the investigation, samples from distant ponds and streams were analyzed to establish background concentrations. The results of the investigation[9] indicated that within the plant drainage ditch:

- surface water analyses indicated that no parameters occur above guideline values;

- sediment analyses indicated that plutonium-238 and a series of polyaromatic hydrocarbons (semi-volatile organic compounds) occur above guideline criteria (Table 2);

- subsurface soils analyses indicated that radium-226 and thorium-228 occur above guideline criteria (Table 3). The values are, however, at or below background. The draft background values established indicated that the guideline value for radium-226 is below background.[9]

Table 2 - Summary of Plant Drainage Ditch Sediment Results[9] above Guideline Criteria

Parameter	No. of Samples	Risk-Based Guideline Criteria	Concentration Range	Units
Plutonium-238	11	25	6.2-28.0	pCi/g
Benzo(a)pyrene	10	0.41	0.47-11.0	mg/kg
Benzo(a)anthracene	2	4.10	4.6-14.0	mg/kg
Benzo(a)fluoranthene	2	4.10	6.0-20.0	mg/kg
Dibenzo(a,h)anthracene	2	0.41	0.5-2.0	mg/kg
Indeno(1,2,3-cd)pyrene	1	4.10	7.5	mg/kg

Table 3 - Summary of Plant Drainage Ditch Subsurface Soils Results [9] above Guideline Criteria

Parameter	No. of Samples	Risk-Based Guideline Criteria	Concentration Range	Units
Radium-226	16	0.14	0.58-1.27	pCi/g
Thorium-228	3	0.85	0.97-1.18	pCi/g

READING ROOM REFERENCES:

1) Operable Unit 9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 7-9)
2) Preliminary review/Visual Site Inspection [Draft], U.S. Environmental Protection Agency, July 1988.(pages 10-13)
3) Operable Unit 9, Remedial Investigation/Feasibility Study, Site Wide Work Plan, April 1992. (pages 14-17)
4) Operable Unit 9, Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 18-27)
5) Operable Unit 9, Site Scoping Report: Volume 7 - Waste Management, February 1993. (pages 28-33)
6) Operable Unit 9, Site Scoping Report: Volume 11 - Spills and Response Actions, March 1992. (pages 34-41)
7) Operable Unit 6, Area 19 and 14 Verification Sampling and Analysis Report. (pages 89-96)

OTHER REFERENCES:

8) Other Soils Characterization Report [Draft] January 1996. (pages 42-49)
9) Operable Unit 9, Surface Water and Sediment Report [Draft] March 1996. (pages 50-88)

PREPARED BY:

Dean A. Buckner, Member of EG&G Technical Staff
Alexander Bray, Member of EG&G Technical Staff

Reference 3

PRS 68

PRS HISTORY:

PRS 68 is the Asphalt Pond located near Building 61 in the northeast corner of the plant. This site was identified as a PRS during the Preliminary Review/Visual Site Inspection[4] for RCRA Facility of Mound Plant in 1988.

PROCESS DESCRIPTION:

The Asphalt Lined Pond began operating in the 1970s and is still in use.[2] It is approximately 150 ft by 150 ft with a nominal capacity of 1.5 million gallons. The pond receives storm water from the SM/PP Hill storm sewers, SM/PP hillside runoff, and non-contact cooling water. The pond's bottom and sides are covered with a layer of asphalt. The pond provides temporary storage, flow equalization, and retention time for removing suspended solids prior to discharge to the drainage ditch. Sediment buildup in the pond is minimal and sediments have been removed from the pond only once during its operation, in 1982. Cracks in the asphalt liner were observed during the removal of vegetation from the north end of the pond during the summer of 1991.

CONTAMINATION:

Water samples and sediment samples were taken from the pond.[3] All contaminants detected in the composited water samples were at concentrations less than the guideline values. The sediment samples contained plutonium-238 at a concentration of 160 pCi/g which is in excess of the Mound guidelines value of 25 pCi/g. No other radionuclides exceeded the guideline values.

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages. 5-11).
2) OU9, Site Scoping Report: Volume 7 - Waste Management, July 1992 (pages. 12-13).
3) OU9, Remedial Investigation/Feasibility Study, Site Wide Work Plan, May 1992. (pages 14-18)
4) Preliminary Review/Visual Site Inspection for RCRA of Mound Plant, July 1988. (pages. 19-21).

OTHER REFERENCES:

5) OU9, Surface Water and Sediment Investigation Report, Draft Technical Memorandum, (Revision 0), March 1996. (pages 22-25)

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Dean A. Buckner, Member of EG&G Technical Staff

Reference 4

PRS 70

PRS HISTORY:

PRS 70 is located in the southwestern corner of the original plant site and consist of an open-topped impoundment with earthen sides which is used to control the flow of water from the open drainage ditch. The bottom is partitioned into three basins by concrete dividers. The north basin is approximately 20 ft. by 40 ft., the south basin is approximately 60 ft. by 75 ft. and the west basin is approximately 45 ft. by 140 ft. Also included in this PRS is the Weir Basin, with dimensions of approximately 40 ft. by 40 ft.. It is connected to the retention basins by a spillway from the west basin to the weir basin. PRS 70 was identified as a potential release site because the basins were potentially contaminated by process water from the Plant Drainage Ditch according to the Operable Unit 9, Site Scoping Report: Volume 7 - Waste Management [2] and the SM/PP Hill Storm Sewers according to the Operable Unit 9, Site Scoping Report: Volume 12 - Site Summary Report.[1]

PROCESS DESCRIPTION:

The rainfall runoff and facility effluent from the plant drainage ditch flow into the northernmost basin discharging to the south basin and finally into the west basin. A spillway in the west retention basin discharges into the weir basin when the retention basins have filled to capacity. Two underground concrete culverts direct discharge from the weir basin into the Miami-Erie Canal then to the Great Miami through an unused portion of the canal. The capacity of the retention basins is estimated to be 230,000 to 260,000 gallons at normal pool elevation and 400,000 to 450,000 gallons at maximum pool elevation. The basins receive approximately 410,000 gallons of process water per day according to Operable Unit 9, Site Scoping Report: Volume 7 - Waste Management.[2]

CONTAMINATION:

Operable Unit 9, Site Scoping Report: Volume 7 - Waste Management [2] states that water and sediment samples were collected from nine locations around the periphery of the northeastermost retention basin. The water and sediment samples were composited to form one sample for each medium for laboratory analysis. The sample analysis included RCRA EP toxicity parameters and all were found to be below the RCRA level.

Contaminants which can be compared to guideline values:

Contaminant	Maximum Detected Value	Comparison Guideline Criteria
Barium	0.31 mg/L	2.0 mg/L
Plutonium (Pu-238)	160.1 pCi/g	25 pCi/g
Potassium (K-40)	23.0 pCi/g	37 pCi/g
Radium (Ra-228)	1.52 pCi/g	5 pCi/g

Cesium (Cs-137)	0.39 pCi/g	0.46 pCi/g (background is 0.42 pCi/g)

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, (Final), September 1994. (pages 6-8)
2) OU9, Site Scoping Report: Volume 7 - Waste Management, (Final), February 1993. (pages 9-12)
3) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, (Final), June 1993. (pages 13-16)
4) Remedial Investigation/Feasibility Study, OU9, Site-Wide Work Plan, Volume II, (Final), May 1992. (pages 17-20)
5) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Volume I - Text, (Final), June 1995. (pages 21-26)

OTHER REFERENCES:

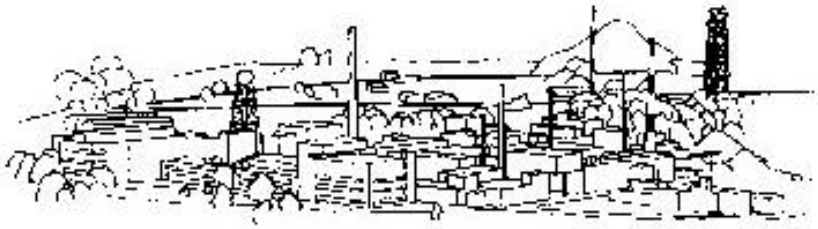
6) Preliminary Review/Visual Site Inspection for RCRA Facility of Mound Plant, July 1988. (pages 27-28)
7) Water and Sediment Sampling/Analysis USDOE - Mound Run-Off Ponds, MRC Quote #441016-9180, (Final), July 1987. (pages 29-47)

PREPARED BY:

Jean Boling, Member of EG&G Technical Staff

Reference 5

Babcock & Wilcox of Ohio, Inc.



Miamisburg Environmental Management Project

ANNUAL SITE ENVIRONMENTAL REPORT FOR CALENDAR YEAR 1997

September 1998

MOUND
is operated for the
U. S. Department of Energy
under contract No. DE-AC24-97OH20044

Table A-3. Average Annual Concentration of Radionuclides in Water Effluents in 1997

Outfall*	Radionuclide	Average Concentration (µCi/mL)	Average as a Percent of DOE DCG[a]
602	Tritium	3.03×10^{-6}	0.15
	Pu-238	7.80×10^{-13}	0.20
	Pu-239,240	1.81×10^{-13}	0.006
	U-233,234	4.51×10^{-10}	0.09
	Th-228	2.80×10^{-12}	0.001
	Th-230	8.60×10^{-13}	0.003
	Th-232	1.20×10^{-13}	0.002
002	Tritium	2.42×10^{-6}	0.12
	Pu-238	8.16×10^{-13}	2.04
	Pu-239,240	3.28×10^{-13}	0.01
	U-233,234	4.51×10^{-10}	0.09
	Th-228	6.90×10^{-11}	0.037
	Th-230	3.80×10^{-11}	0.013
	Th-232	2.50×10^{-11}	0.050
601	Tritium	2.20×10^{-6}	0.11
	Pu-238	1.29×10^{-13}	0.32
	Pu-239,240	1.74×10^{-13}	0.006
	U-233,234	4.55×10^{-10}	0.09
	Th-228	5.50×10^{-12}	0.001
	Th-230	1.70×10^{-12}	0.001
	Th-232	ND	ND
003	Tritium	3.48×10^{-6}	0.17
	Pu-238	6.33×10^{-12}	0.02
	Pu-239,240	1.65×10^{-12}	0.006
	U-233,234	2.67×10^{-10}	0.07
	Th-228	ND	ND
	Th-230	ND	ND
	Th-232	7.60×10^{-13}	0.015

[a] DOE DCG values in water:
Tritium = 3×10^{-2} µCi/mL
Pu-238 = 4×10^{-8} µCi/mL
Pu-239,240 = 3×10^{-8} µCi/mL
U-233,234 = 5×10^{-7} µCi/mL
Th-228 = 4×10^{-7} µCi/mL
Th-230 = 3×10^{-7} µCi/mL
Th-232 = 5×10^{-8} µCi/mL

ND = average results not detected above reagent blanks

* Sampling locations shown on Figure 4-1.

Table C-3. (continued)

Sampling Location*	No. of Samples	Minimum	Maximum	Annual Average	Highest Monthly Average	NPDES Permit Limit	
						Daily	Monthly Average
Outfall 002 Parameters							
Flow rate, MGD	5	0.0	2.920	0.376	0.510	n/a	n/a
pH, s.u.	52	7.2	8.9	8.0	8.4	6.5-9.0	n/a
Suspended solids[b], mg/L	49	<1	97.8	11.9	26.8	45	30
Outfall 001 Parameters							
Flow rate, MGD	[illegible]	0.041	0.307	0.165	0.187	n/a	n/a
pH, s.u.	27	7.2	8.6	8.0	8.3	6.5-9.0	n/a
Residual chlorine[d], mg/L	49	<0.01	0.22	<0.01	0.04	0.028	n/a
Cyanide, µg/L	12	<5	<5	<5	<5	0.083	0.023
Pentachlorophenol, µg/L	10	<10	<10	<10	<10	n/a	n/a
Bis (2-ethylhexyl) phthalate, µg/L	10	<5	5.8	<5	5.8	n/a	n/a
Cadmium, µg/L	41	<10	26	<10	26	43	n/a
Chromium, µg/L	44	<15	34	<15	19	876	506
Copper, µg/L	44	27	190	50	105	123	n/a
Nickel, µg/L	44	<15	173	36	173	1261	760
Lead, µg/L	44	<15	44	<15	15	305	191
Zinc, µg/L	45	<15	111	55	70	n/a	n/a

[a] Summer months only (May 1 through October 31). n/a = not applicable, no permit limits.

[b] [illegible] 3 days during the week. MGD = million gallons per day

[c] Continuous.

* Sampling locations shown on Figure [illegible].

Note: New NPDES permit parameters went into effect November 1, 1997.

Reference 6

DRAFT

Miamisburg Environmental Management Project

ANNUAL SITE ENVIRONMENTAL REPORT FOR CALENDAR YEAR 1998

September 1999

DRAFT

Table A-3. Average Annual Concentration of Radionuclides in Water Effluents in 1998

Outfall*	Radionuclide	Average Concentration (μCi/mL)	Average as a Percent of DOE DCG*
602	Tritium	6.22×10^{-6}	0.31
	Pu-238	9.21×10^{-7}	0.23
	Pu-239	1.90×10^{-12}	0.006
	U-233,234	4.27×10^{-10}	0.09
	Th-228	4.83×10^{-11}	0.001
	Th-230	5.10×10^{-10}	0.002
	Th-232	1.0×10^{-10}	0.002
603	Tritium	2.34×10^{-6}	0.12
	Pu-238	8.41×10^{-7}	2.10
	Pu-239	5.01×10^{-7}	0.017
	U-233,234	4.32×10^{-9}	0.09
	Th-228	3.13×10	0.008
	Th-230	5.34×10^{-9}	0.018
	Th-232	1.56×10^{-10}	0.031
601	Tritium	2.75×10^{-6}	0.14
	Pu-238	6.54×10^{-11}	0.16
	Pu-239	2.58×10^{-13}	0.009
	U-233,234	2.53×10^{-9}	0.07
	Th-228	ND	ND
	Th-230	4.10×10^{-11}	0.002
	Th-232	ND	ND
003	Tritium	2.40×10^{-6}	0.12
	Pu-238	6.09×10^{-12}	0.02
	Pu-239,240	1.82×10^{-12}	0.006
	U-233,234	3.76×10^{-9}	0.08
	Th-228	3.70×10^{-12}	0.0007
	Th-230	4.30×10^{-11}	0.001
	Th-232	1.70×10^{-12}	0.003

DOE DCG values in water
- Tritium = 2×10^{-3} μCi/mL
- Pu-238 = 4×10^{-6} μCi/mL
- Pu-239,240 = 3×10^{-6} μCi/mL
- U-233,234 = 5×10^{-7} μCi/mL
- Th-228 = 4×10^{-7} μCi/mL
- Th-230 = 3×10^{-7} μCi/mL
- Th-232 = 5×10^{-7} μCi/mL

ND = average results not detected above reagent blanks.

* Sampling locations shown on Figure 4-1.

Table C-3. (continued)

Sampling Location*	No. of Samples	Minimum	Maximum	Annual Average	Highest Monthly Average	NPDES Permit Limit: Daily	NPDES Permit Limit: Monthly Average
Outfall 003 Parameters							
Flow rate, MGD	[illegible]	0.049	2.206	0.380	0.792	n/a	n/a
pH, s.u.	52	7.5	9.0	8.3	8.5	6.5-9.0	n/a
Suspended solids[c], mg/L	52	1.6	57.2	15.3	31.7	45	30
Outfall 001 Parameters							
Flow rate, MGD	[illegible]	0.025	0.622	[illegible]	0.154	n/a	n/a
pH, s.u.	24	7.7	8.8	8.1	8.6	6.5-9.0	n/a
Cyanide, µg/L	12	<5	<5	<5	<5	n/a	n/a
Cadmium, µg/L	12	<10	<10	<10	<10	n/a	n/a
Chromium, µg/L	12	<15	<15	<15	<15	n/a	n/a
Copper, µg/L	12	<15	98	19	98	120	n/a
Nickel, µg/L	12	<15	67	21	67	n/a	n/a
Lead, µg/L	12	15	140	20	140	n/a	n/a
Zinc, µg/L	12	<25	164	49	164	n/a	n/a

[illegible]

c Limit applies if > 0.25 inches of rainfall 2 days during the week.

* Sampling locations shown on Figure 5-1.

MGD = million gallons per day

n/a = not applicable, no permit limits

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Hierarchy For: PRS 419

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LEVEL 1 LAWS/REGULATIONS (Imposed by Outside Authority)	
LEVEL 2 AGREEMENTS	PRS Package
LEVEL 3 MOUND SITE-WIDE DOCUMENTS (POLICY & GUIDANCE FROM BWO)	
LEVEL 4 ORGANIZATIONAL/OPERATIONS DOCUMENTS	
LEVEL 5 PROCEDURAL/INSTRUCTIONAL DOCUMENTS	
LEVEL 6 REPORTS AND PERFORMANCE INDICATORS	